

SCOPUS

A FIELD STUDY OF THE CORNCRAKE *CREX CREX* AT NDOLA, ZAMBIA

P.B. Taylor

The major wintering area of the Corncrake *Crex crex* is believed to be the eastern half of Africa from Tanzania, Zambia and Mozambique through Malawi and Zimbabwe to eastern South Africa (Cramp & Simmons 1980). Although the habits of this crane are well-known in the Palaearctic region, and although the species is regarded as common or regular over much of its winter range (Cramp & Simmons 1980), almost nothing has been recorded of its habits in Africa. During my residence in Zambia from 1975 to 1980 I had the opportunity to make regular observations of several rallid species at an area of grassland bordering permanent swamp at Itawa, Ndola (12.57S, 28.47E) at an altitude of 1300 m. The grassland held a small number of wintering Corncrakes and frequent visits with my dog produced numerous sightings of these and other cranes. The amount of human disturbance around the study area was considerable and it was therefore not possible to trap the cranes, but by frequent observation I was able to estimate the total number of wintering Corncrakes and to record details of their habits and movements. My observations are summarized in this paper.

THE STUDY AREA

The study area lies at the southern end of the 11 km-long Itawa *dambo*, much of which is permanent swamp and which represents the outcrop of the local water table. The underlying rocks are limestone and dolomite, and the surface soil is grey clay with a proportion of silt (Moore 1967). The vegetation of the study area is grassland, some of which remains dry throughout the year although much becomes damp or inundated during the November to April rains. The drier grassland contains scattered *Acacia* bushes, moister areas have thickets of *Acacia* with *Lantana*, *Ficus* and *Brachystegia*, and the wettest areas contain small dense evergreen thickets.

METHODS

Frequent visits were made to the study area from early 1975 to mid 1980 but detailed studies of the Corncrake population were carried out only from November 1978 to April 1980. By recording the exact location of each Corncrake

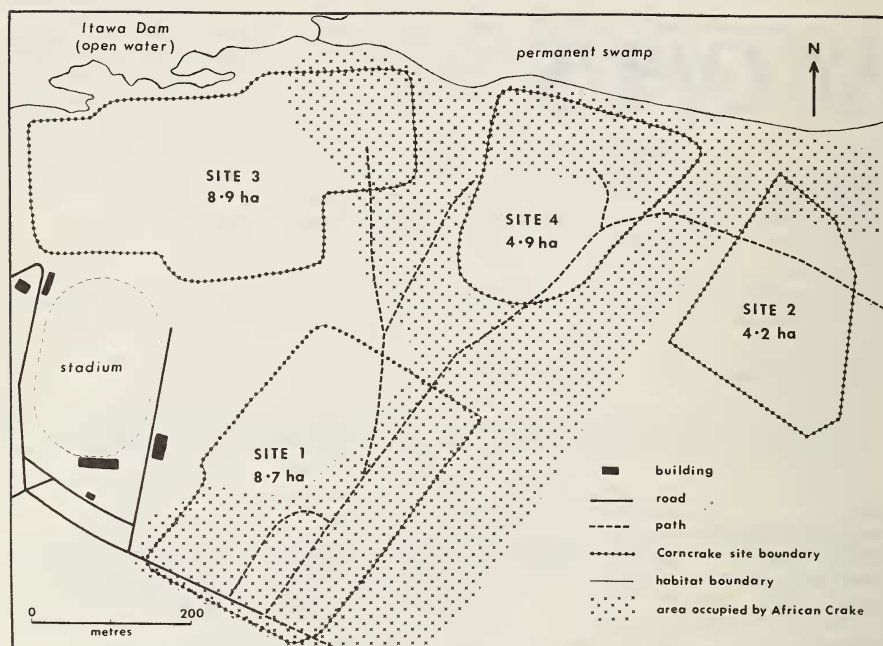
Fig. 1. *The Itawa study area*

TABLE 1

Visits to Itawa sites 1978-79 and 1979-80

	Period of occupation	Days in period	No. of visits	Successful visits	Average No. of days between visits
Site 1	4 Dec 78 - 9 Apr 79	127	50	24(48%)	2.5 (2.1) *
	5 Dec 79 - 7 Apr 80	124	33	16(48%)	3.8
Site 2	26 Jan 80 - 4 Apr 80	70	15	10(67%)	4.7
Site 3	16 Jan 79 - 18 Mar 79	62	24	9(37%)	2.6
Site 4	20 Dec 78 - 1 Mar 79	72	15	7(47%)	4.8 (3.5) *

* Figures in brackets represent the average excluding the 20-day period of the observer's absence

sighting and by ensuring that all parts of the study area were frequently searched with the aid of the dog, it was possible to delimit the areas of grassland occupied by the crakes. This work was made easier by the nature of the habitat: the occupied areas ('sites') were in patches of dry to moist grassland separated from each other by intervening unsuitable habitat (very

wet or very sparse grass) and some of their boundaries were well-defined by adjacent flooded, cleared or disturbed areas.

Four wintering sites were mapped and their areas calculated (Fig. 1); the boundaries represent the limits of the suitable habitat in all sites except site 2, which was within a large tract of apparently suitable grassland. The boundaries of site 2 were plotted by joining the loci of the outermost sightings to give a convex polygon. All records of wintering birds fell within the site boundaries. That part of the study area occupied by the breeding population of African Crakes *Crex egregia* was also determined (Taylor in prep.) and is shown in Fig. 1.

In order to estimate the wintering population of Corncrakes and to ascertain whether movements occurred either between sites or into and out of the study area, an attempt was made to search all parts of the study area regularly and to cover as many sites as possible on each visit. Four factors caused total coverage to be less than was planned:

- a) the inadvisability of searching any site too frequently because of the risk that the crakes might leave if disturbed too often and because the habitat would have suffered from excessive trampling. As nothing is known about Corncrake habits in Africa it could not be judged how much disturbance the birds would tolerate.
- b) the difficulty of searching each site's entire area at each visit to the site; this applied especially to sites 1 and 3, each of which had an area in excess of 8 ha.
- c) the prevention of some planned visits by bad weather.
- d) the absence of the observer for 20 days in December 1978 to January 1979.

During the periods 1 December to 15 April in 1978-79 and 1979-80, visits were made on 85 out of 136 days and 76 out of 137 days respectively. With the exception of the 20-day period of absence, the maximum period between visits to a site was 8 days. The average frequency of visits to each site is given in Table 1. The pattern of visits was not uniform and the methods used were far from ideal; however, it is felt that no better could have been achieved under the circumstances (trapping being impossible) and the high percentage of successful visits achieved (Table 1) shows how effective is the simple method of disturbance - with the aid of an experienced dog.

HABITAT PREFERENCES

The preferred habitat of the Corncrake in Africa is usually given as any dry open grassland or grass plain (e.g. Benson et al. 1971, Cramp & Simmons 1980) but damper areas may also be occupied (Moreau 1972). Observations at Itawa support these statements of habitat preferences and in the study area Corncrakes occurred in grassland on the clay soil adjacent to the swamps, normally occupying the drier areas (78 per cent of 106 sightings were in dry grassland). They were most often found in the denser grass cover, were rarely seen in areas of sparse cover, and inhabited grass of heights from 0.3 to 2 m. They also occurred in moist grassland (16 per cent of sightings) and occasionally in flooded grassland (6 per cent of sightings). In the moister areas they occurred alongside the breeding African Crakes but in areas of overlap the African Crakes usually occupied the wetter patches; however, African Crakes also ventured into dry areas and both species were occasionally flushed together from dry grass. The Corncrakes did not occur in sparsely-grassed neglected ploughland in the southeast of the study area nor in neglected cultivation and maize patches immediately to the northeast. Elsewhere in

Zambia, Corncrakes were observed in similar habitat to that at Itawa but were also occasionally seen in rank grass at the edges of sewage settling tanks (e.g. at Kanini Sewage Works, Ndola), a habitat which they probably only occupied temporarily.

POPULATION

The wintering population at Itawa was very small (2 to 3 birds each winter) and occupied no more than 26.7 ha of suitable habitat out of about 80 ha of grassland and swamp edge. No more than one individual was flushed at any site during the wintering period (December to March) and it was assumed that wintering birds were solitary, as they are normally said to be in the non-breeding season (Cramp & Simmons 1980). Furthermore, as the birds were regularly seen in the same small areas, as individuals were sometimes seen at two or more sites during one visit and as the total number of birds seen in the study area remained constant for most of the winter it was concluded that local movements did not normally take place and that all the wintering birds had been counted. It is unlikely that any wintering birds were overlooked, as the entire study area was searched and the birds were not difficult to flush. In some seasons, one or more apparently suitable sites remained unoccupied, e.g. no Corncrake was seen at site 2 until 1979-80; the reasons for this are not known.

Sites 2 and 4 appeared to be fully utilized, sightings occurring throughout their areas. Sites 1 and 3 contained somewhat less dense cover, and site 3 contained patches of permanently unsuitable habitat (large thickets, scrub) and patches which were temporarily unsuitable due to occasional flooding, grass-cutting and clearing of small areas for cultivation. The total suitable habitat within site 3 was estimated at about 4.5 ha at any time. Observations at site 1 in 1978-79 indicated that the southern half of the site was occupied in December (before the grass had grown in the northern half) and that the northern half was occupied (presumably by the same bird) from January to March; from late March the situation was reversed, with the southern half being occupied until the bird left in April. Thus for most of the winter only half of site 1 was in use (about 4.3 ha), this representing the more suitable grassland at the site. In 1979-80 a similar pattern was observed at site 1.

As individual Corncrakes could not be recognized it was not possible to show that a bird seen at a site for a long period was always the same individual, but this was thought to be probable. It may be assumed, however, that each site was occupied by only one bird and thus that the total area of grassland inhabited by one bird was between 4.2 and 8.9 ha, with only 4.3 and 4.5 ha of the two largest sites being used for most of the winter. The average area used by one bird was therefore 4.5 ha. These figures may be compared with the size of the area occupied by the breeding African Crakes (somewhat smaller than Corncrakes) at the same locality. Eight pairs of African Crakes were counted at Itawa in 41.6 ha of grassland, a density of 1 pair per 5.2 ha (Taylor in prep.); this habitat was also apparently able to support their offspring as the season advanced. Of these 41.6 ha, 10.1 ha (24.3 per cent) were within the mapped sites of the Corncrakes (see Fig. 1).

The reasons why the African Crakes were able to exist at a higher density than the Corncrakes at Itawa are not clear: possibly the wetter habitat favoured by the former species was more productive of food than the drier grassland occupied by the latter. The problem is complicated by the possibility that the feeding methods (and possibly the food) of the two species may differ (see Food and Feeding Habits below).

MOVEMENTS AND PATTERN OF OCCURRENCE

Corncrakes arrived at Itawa from late November to late January and departed between March and early April. First and last dates were:

	First date	Last date
1976/77	23 Nov	31 Mar
1977/78	27 Dec	11 Mar
1978/79	4 Dec	9 Apr
1979/80	5 Dec	7 Apr

These dates agree well with the period of occurrence (24 November to 4 April) given for Zambia by Benson *et al.* (1971), and other recent Zambian records have also fallen within this period with the exception of 1976 when arrival was noted as early as 21 October (*Zambian Ornithological Society Newsletters* 1977-1980, Taylor 1979).

No evidence of large-scale movements was seen at Itawa (but overnight passage could have occurred) and most records probably refer to wintering birds, but scattered November to January sightings in areas not normally occupied probably represent individuals on local or long-distance movements. During the 1978-79 and 1979-80 winters birds were seen at the sites for long periods (Table 1) and, although restricted movements within one site occurred (see Population above), evidence for local movements was seen only once during each of these winters: despite searching, no Corncrakes were seen in any site from 11 to 21 February 1979 and from 27 December 1979 to 14 January 1980. The birds may have left the study area at these times and, in the former period, heavy rain may have made conditions temporarily unsuitable. In the latter period, however, conditions appeared to remain favourable. The normal pattern of occurrence was not followed in the 1977-78 winter, when the total rainfall at Ndola was 29.8 per cent higher than the average for the other seasons of the author's residence (P. Gilbert *in litt.*) and when conditions at Itawa were probably too wet to favour the Corncrakes' residence. Arrival was late (27 December) and no Corncrakes were seen from 31 December 1977 to 24 February 1978, when a temporary influx occurred; these birds soon departed, the last being seen on 11 March.

Thus it appears that local movements of the wintering population may take place, probably in response to changing local conditions. The only other suitable habitat in the Itawa area was at the edge of Ndola airport, some 1.8 km SSE of the study area, but it was not possible to ascertain whether Corncrakes ever occurred there. Studies (pers. obs.) in Zambia and Kenya show that other species of crakes are itinerant in their non-breeding areas but that this behaviour is, predictably, more pronounced in wet-habitat species such as the Spotted Crake *Porzana porzana*, Lesser Spotted (Baillon's) Crake *P. pusilla* and Striped Crake *P. [Aenigmatolimnas] marginalis* than in the Corncrake, which occurs in a drier and more stable habitat.

GENERAL HABITS

Corncrakes are said to be quite tame but skulking and to often occur out of cover (Cramp & Simmons 1980). At Itawa they were occasionally seen feeding in the open on narrow paths through the grassland and at the edges of leterite roads, but they were much more skulking than the African Crakes which were frequently seen in the open. If a slow and quiet approach could be made, it was sometimes possible to walk to within 10m of a Corncrake in the open without alarming it. When surprised outside cover, the normal reaction of the bird was to run swiftly away for a few metres with neck retracted and then to

stand erect with neck stretched up and watch the intruder; this could be repeated several times. African Crakes showed very similar reactions in the same situation. If not greatly alarmed, the Corncrake would either then continue feeding or would walk off, not always seeking cover immediately and sometimes appearing curious rather than unduly nervous.

Corncrakes at Itawa were not difficult to flush from cover when located by the dog and they flew most readily from short grass; in very tall cover they were sometimes able to escape the dog by running. Most of the birds located in cover were flushed by the dog after a short search, and an observer without a dog could also flush birds from short grass. Normal escape flights were no longer than 50 m. It was not difficult to flush a bird two or three times; when thus disturbed the bird would often finally land at the edge of bushes or thickets which it would then penetrate for concealment (but from which it could still be flushed by the dog). Escape flights were also made around thickets, the bird landing on the opposite side to the observer.

Most visits to the Itawa grassland were made from 05:30 to 07:00 and from 17:30 to 19:00 local time. Corncrakes were found to be active from 10 to 15 min after first light and to cease activity at about dusk; they were not encountered before dawn or after dark despite attempts to locate them at these times. This contrasts with behaviour on the breeding grounds, where they may be active during the night (Witherby *et al.* 1941). Unlike the African Crake, which shows greater activity in the morning than the evening (Taylor *in prep.*), the Corncrakes showed no significant difference in morning and evening activity: combining results from all sites, the percentage of successful visits (i.e. when Corncrakes were seen) in the mornings was 47 per cent, in the evenings 50 per cent ($P > 0.8$, χ^2 test). Occasional visits made between 07:30 and 17:30 produced no sightings after 10:00 but it is not known whether all activity ceased during the hottest parts of the day. Drizzle or light rain did not appreciably affect activity, but birds were not active during or just after heavy rain.

VOICE

Corncrakes are said to be silent in Africa (McLachlan & Liversidge 1978) and only once was one heard to call at Itawa: a bird surprised in the open flew off immediately with a loud and rather thrush-like *tsuck* call. This may be a stress call similar in nature to the loud *kip* call of the African Crake (Taylor *in prep.*). The only similar call recorded for the Corncrake in the Palaearctic is a *ki* or *kah*, said to be "much like the monosyllabic note of other crakes" (Witherby *et al.* 1941).

FOOD AND FEEDING HABITS

Although at times occurring alongside the African Crake at Itawa, no instances of interspecific aggression were observed and the two species appeared to co-exist amicably. This suggests that they are not in direct competition for food and, although their diets are similar (e.g. Cramp & Simmons 1980, Mackworth-Praed & Grant 1957, Ripley 1977), the longer heavier bill of the African Crake (measurements in, for example Ripley 1977 and *pers. obs.*) suggests that different sized food items may be taken and/or that different feeding methods may be used.

It was not possible to establish the range of food items taken by these species at Itawa and birds of both species feeding (never together) in open areas appeared to be taking a variety of invertebrate and vegetable matter.

The African Crake has been seen to dig and probe with its bill (Taylor in prep.) but this behaviour is not recorded for the Corncrake by Cramp & Simmons (1980).

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P.B. Taylor, Box 25138, Nairobi

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